

Notice of Allowability

Application No.

10/706,478

Applicant(s)

KAUL, UPENDER K.

Examiner

Suzanne Lo

Art Unit

2128

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to RCE filed on 09/20/06.
2. ☒ The allowed claim(s) is/are 1-8.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 09/20/06
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

ALLOWANCE

1. The information disclosure statement (IDS) submitted on 09/20/06 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the Examiner has considered the IDS as to the merits.

2. The following is an examiner's statement of reasons for allowance:

Applicants are disclosing a method and system for generating an elliptic grid of coordinates in two dimensions or three dimensions by providing defining equations, valid near at least one boundary segment in a generalized coordinate system, providing a selected group of boundary constraints for the grid system, providing a correspondence between a selected power of a heat transfer coefficient, determining a solution of the grid system, and displaying the solution of the grid system. This has been disclosed in the prior art of record.

The prior art of record does not disclose the method and system wherein providing a selected group of boundary constraints for the grid system, valid near the at least one boundary segment, *where a decay parameter for at least one of the generalized coordinate dependent variables near the at least one boundary segment is determined as part of a solution for the grid system, rather than being prescribed initially*; providing defining equations and selected boundary conditions, having at least two independent coordinate variables and at least one dependent variable, for *steady state heat transfer on a long thin fin*, and providing a correspondence between the at least two independent coordinate variables for the grid system near the at least one grid boundary segment with the at least two independent coordinate variables for the heat transfer problem.

The closest prior art uncovered during examination teaches certain limitations of the claimed invention as follows:

U.S. Patent No. 5,923,329, Beale: Discloses providing defining equations, valid near at least one boundary segment in a generalized coordinate system (column 10, lines 14-29), of a selected grid system,

Art Unit: 2128

where each of the defining equations has at least two independent Cartesian coordinate variables (column 1, lines 59-66), has at least one generalized coordinate as a dependent variable (column 1, lines 64-66), and comprises a partial differential equation (column 1, line 66 – column 2, line 9, equation 1), expressed in at least one generalized coordinate (column 2, equation 1); providing a selected group of boundary constraints for the grid system (column 10, lines 14-29), valid near the at least one boundary segment, providing defining equations and selected boundary conditions, having at least two independent coordinate variables and at least one dependent variable, for steady state heat transfer (column 6, lines 34-41), and providing a correspondence between the at least two independent coordinate variables for the grid system near the at least one grid boundary segment with the at least two independent coordinate variables (column 7, lines 22-29) for the heat transfer problem (column 1, lines 42-48); providing a correspondence between a selected power of at least one heat transfer coefficient for the heat transfer problem and at least one decay parameter for the grid system near the at least one grid boundary segment (column 7, lines 63-67); determining a solution of the grid system near the at least one grid boundary segment that incorporates at least one boundary constraint comprising the at least one decay parameter determined for the grid system (column 7, lines 63-67); and displaying the solution of the grid system (Figure 12g). However, Beale does not disclose where a decay parameter for at least one of the generalized coordinate dependent variables near the at least one boundary segment is determined as part of a solution for the grid system, rather than being prescribed initially and providing defining equations and selected boundary conditions, having at least two independent coordinate variables and at least one dependent variable, for steady state heat transfer on a long thin fin.

U.S. Patent No. 6,064,810, Raad et al.: Teaches determining a solution of a system (column 4, lines 43-55) with boundary conditions (column 4, lines 28-32) for steady-state heat transfer (column 3, lines 47-51, column 4, lines 43-45) but again does not disclose a decay parameter that is determined as

Art Unit: 2128

part of a solution for a grid system rather than being prescribed initially and does not provide a solution for a long thin fin.

“Development of Three-Dimensional DRAGON Grid Technology”, Zheng: Teaches determining a solution of a grid system (page 8, section 3.1) with boundary conditions (page 6, section 2.2) with partial differential equations (page 7, section 2.2.1) but again does not disclose a decay parameter that is determined as part of a solution for a grid system rather than being prescribed initially and does not provide a steady-state heat transfer solution for a long thin fin.

Likewise, **“2D Orthogonal Grid Generation with Boundary Point Distribution Control”**, Eca: Teaches determining a solution of a grid system (page 441, Section 2, 1st paragraph) with boundary conditions (page 441, Section 2, 2nd column, 2nd paragraph) with partial differential equations (page 441, Section 2, Equations 2 and 4) but again does not disclose a decay parameter that is determined as part of a solution for a grid system rather than being prescribed initially.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled “Comments on Statement of Reasons for Allowance.”

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. **“PELLPACK: A Problem-Solving Environment for PDE-Based Applications on Multicomputer Platforms”** published by Houstis et al. in March 1998. The subject matter disclosed therein is pertinent to claims 1 and 5 (elliptic grid model with partial differential equations).

2. **“Scalable Parallel Volume Raycasting for Nonrectilinear Computational Grids”** published by Challenger in 1993. The subject matter disclosed therein is pertinent to claims 1 and 5 (Cartesian coordinate grid system, fin modeling).

Art Unit: 2128

3. "Solution of the 3-D Euler equations for the flow about a fighter aircraft configuration using a hypercube parallel processor" published by Weissbein et al. in 1988. The subject matter disclosed therein is pertinent to claims 1 and 5 (Cartesian coordinate grid system and partial differential equations).


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Suzanne Lo whose telephone number is (571)272-5876. The examiner can normally be reached on M-F, 8-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kamini Shah can be reached on (571)272-2297. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Suzanne Lo
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SL
10/27/06


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SUPERVISORY PATENT EXAMINER